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#1

INSTRUCTION MANUAL

MODEL 21 ATTENUATOR

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KAY ELECTRIC CO.
PINE BROOK, N. J.

INTERIM

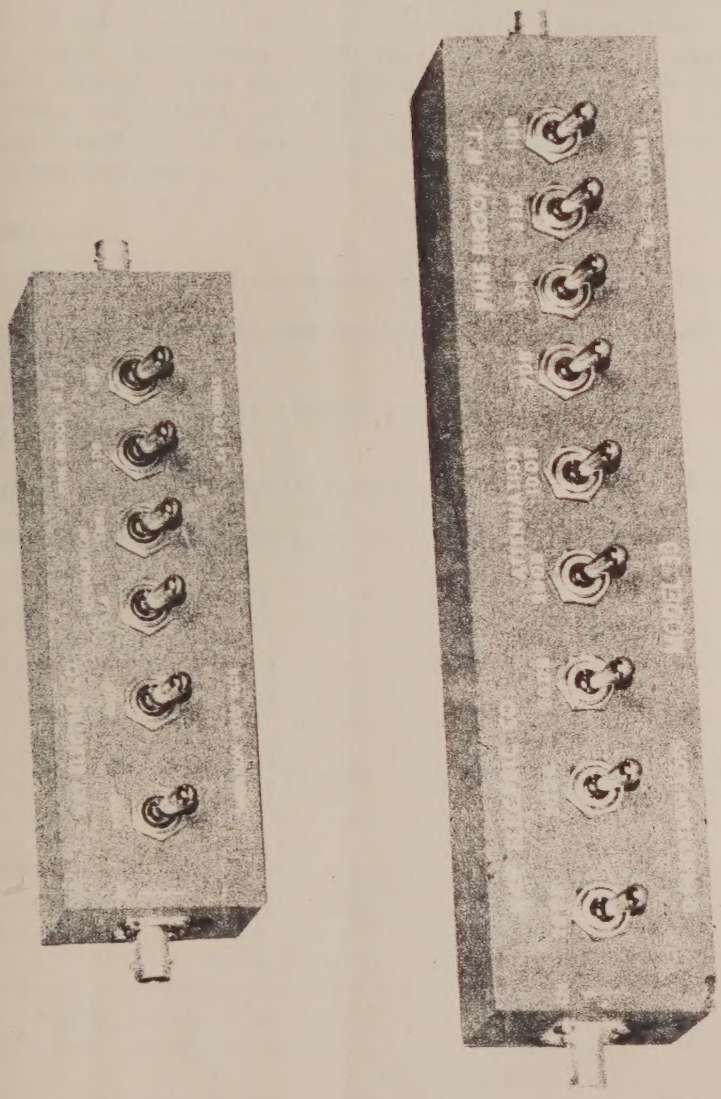
INSTRUCTION MANUAL

ATTENUATORS

KAY ELECTRIC CO.

Pine Brook, New Jersey

May, 1956



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KAY ELECTRIC CO. ATTENUATORS

A. PURPOSE AND GENERAL DESCRIPTION.

The **KAY ATTENUATORS** are designed to provide a means of inserting an accurate and fixed amount of loss in any electronic equipment operating in the DC-500 Mc range. The lower limit of attenuation is fixed by the insertion loss of the attenuator. Individual switches (20 db, 10 db, 5 db, 3 db, 2 db, and 1 db) allow the operator to supplement the insertion loss by 1 db steps. Both input and output impedances are constant at a nominal impedance throughout the useful range of the equipment. BNC-type UG-185/U female connectors are used for input and output terminals. All components are housed in a rugged metal case which provides individual shielding for the 20-db and 10-db sections and overall shielding for the complete unit.

B. TYPICAL APPLICATIONS.

1. Supplemental attenuator for instruments whose attenuation range is insufficient.
2. Replacement attenuator for instruments whose internal attenuators do not provide comparable accuracy
3. Vernier attenuator where signal source includes only large-increment or uncalibrated attenuation.
4. General attenuator for instruments without internal attenuation.
5. Standard attenuator for evaluating other unknown or uncalibrated attenuator.

C. SPECIFICATIONS.

MODEL	20	21	22	20-0	21-0	22-0	30-0	31-0	32-0
CAT. NO.	430-A	440-A	450-A	431-A	441-A	451-A	432-B	442-B	452-B
Z_{IN} Z_{OUT}	50 OHMS. NOM.	70 OHMS. NOM.	90 OHMS. NOM.	50 OHMS. NOM.	70 OHMS. NOM.	90 OHMS. NOM.	50 OHMS. NOM.	70 OHMS. NOM.	90 OHMS NOM.
MAX. POWER	½ WATT								
INSERTION LOSS	10 DB			ZERO DB AT LOW FREQ. APPROX. 0.5 DB AT 200 MC			ZERO DB AT LOW FREQ. APPROX. 0 8 DB AT 200 MC		
DB SWITCHED	41 DB IN 6 STEPS						101 DB IN 9 STEPS		
STEPS	20 DB, 10 DB, 5 DB, 3 DB, 2 DB, 1 DB						20 DB, 20 DB, 20 DB, 20 DB, 10 DB, 5 DB, 3 DB, 2 DB, 1 DB		
FREQUENCY RANGE	DC TO 500 MC.								
ACCURACY OF ATTENUATION	WITHIN 0.1 DB/DB TO 500 MC BETTER ACCURACY AT LOWER FREQUENCIES						0.1 DB/DB AT 220 MC 0.15 DB/DB AT 500 MC BETTER ACCURACY AT LOWER FREQ.		
CONNECTORS	BNC TYPE UG-185/U								
DIMENSIONS	1/4" x 8 1/4" x 2 1/8"						2 1/4" x 11 1/2" x 2 1/8"		
WEIGHT	2 1/2 LB.						3 1/2 LB.		

May 10, 1956

D. OPERATION.

1. To avoid producing spurious losses through impedance mis-match, all input and output connections should be made with UG-88/U plugs.

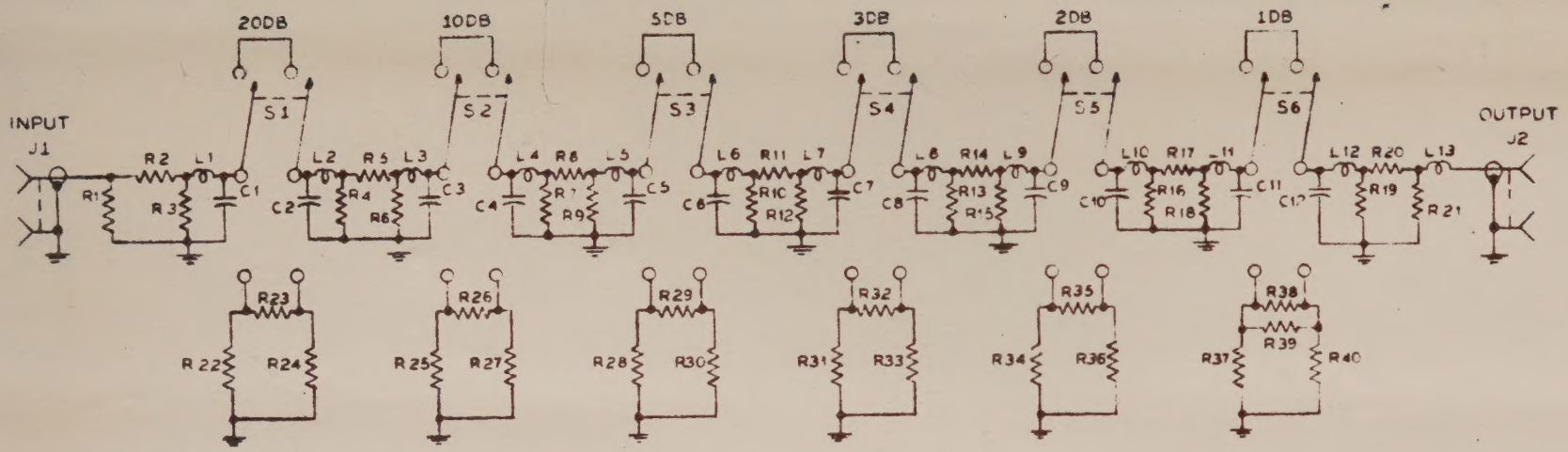
2. A given attenuator section is placed in the circuit when its switch is in the upper position. All the switched attenuators are connected in series and are additive. Thus, to obtain 29 db attenuation throw the 20 db, 5 db, 3 db and 1 db switches to the upper position. Other degrees of attenuation, from 10 db minimum to 51 db maximum may be selected in a similar manner.

   Note that in **ATTENUATOR** models 20, 21, and 22 the fixed 10-db insertion loss must be added to the switchable attenuation.

3. Note that these attenuators constitute a direct d-c path and do not include internal protective devices in the form of fuses, decoupling capacitors, etc. To avoid damage to the internal components do not apply excessive signals to the attenuator.

E. MAINTENANCE AND REPAIR.

In normal operation, the rugged, simple, construction of the **KAY ELECTRIC ATTENUATORS** obviates the necessity for maintenance operations. If, however, it is necessary to replace one or more resistors, it should be noted that the values of some components have been factory-modified to obtain the precise and accurate degrees of attenuation specified in paragraph C. Since the value of any resistor replaced in the field may vary within its specified tolerance, it may be impossible to duplicate the specified operation of these attenuators unless the replacement resistors are similarly modified.



NOTE

ALL RESISTORS TRIMMED FOR EXACT ATTENUATION

CHECK AT 100, 200 & 400 MC

TRIM LEADS ON HIGH ATTENUATION UNITS

L & C'S ARE CAVITY INDUCTANCES AND CAPACITANCES

SCHEMATIC DIAGRAM MODEL NO. 21 ATTENUATOR 70 Ω

KAY ELECTRIC CO. DN AWPIERCE PINE BROOK, N. J.